

Remarks:

Claims 32-63 are pending in the Subject Application. Claims 32-63 stand rejected. The amendment to claim 32 finds support, for example, in at least paragraph 24 of the specification. Claim 33 has been amended to depend from claim 32. Claims 34, 38-40, 44, 48, 55, 59 and 60 have been amended in minor respects unrelated to patentability. No new matter has been introduced by way of amendment to the claims.

REJECTIONS

35 U.S.C. § 102(b)

Claims 32-40, 42 and 43 stand rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 6,164,878 issued to Satran et al. ("Satran"). The Office Action actually lists claims 32-40, 42 and 33 as being rejected, but because claim 33 is included in the range of 32-40, it is assumed that the number "33" is a typographical error, and that the Examiner intended to reference claim 43. Applicant traverses this rejection for the reasons set forth herein.

For a reference to anticipate a claim under 35 U.S.C. § 102(b), it must disclose, either expressly or inherently, each and every element of the claim. *See, e.g.*, MPEP § 2131. Satran cannot anticipate the claims of the Subject Application for at least the reason that Satran does not disclose each and every element of the inventions recited in the rejected claims.

Claim 32 has been amended herein to include the step of "tangentially milling at least one antirotation stop and an insert pocket in the tool holder, wherein the antirotation stop comprises at least two substantially planar surfaces *and protrudes from a side wall of the insert pocket.*" (Emphasis added.) As support for this amendment, Applicants refer the Examiner to, for example, Figure 4F of the Subject Application, which shows at least two substantially planar surfaces protruding from the side wall of the pocket and into the pocket itself. Satran does not disclose an antirotation stop that protrudes from a side wall of the insert pocket. In contrast, the insert pocket of Satran includes no such protrusion and, in fact, includes recesses adjacent to the lateral abutment surfaces that receive the protruding points of the star-shaped form of the

bottom of the cutting insert shown in Satran. This is evident in Figure 5 of Satran, which shows points of the six-sided star shaped cutting insert embodiment, adjacent to the points that are contacting the lateral abutment surfaces, protruding into recesses made to receive the non-abutting points of the star-shaped form. Satran does not disclose an antirotation stop protruding from a side wall and into a cutting insert recess, but instead embodies the opposite arrangement wherein a recess in the side wall receives a protrusion of the cutting insert. Satran does not disclose a protruding antirotation stop; thus, Satran does not disclose each and every element of claim 32 and its dependent claim 33.

Claim 34 recites:

a cutting insert configured for installation in the insert pocket, the cutting insert comprising a top surface comprising a cutting edge, a bottom surface, a circular side wall between the top surface and the bottom surface, and at least one recess through both the bottom surface and the circular side wall, wherein *the recess is at least partially defined by a portion of a sphere.*

(Emphasis added.)

Satran does not disclose the italicized element of claim 34. Satran defines the lower flank surface of its cutting insert as having an n-fold rotational symmetry which, taken in the context of the specification, defines a polygon of intersecting straight lines. The design described in Satran, as such, includes no spherical surfaces in the recesses of the lower flank surface. Thus, Satran does not disclose each and every element of claim 34 and its dependent claims 35-40, 42 and 43, and the rejection of those claims under § 102(b) should be withdrawn.

35 U.S.C. § 103(a)

Claims 48-63 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Satran. Applicant traverses this rejection for the reasons set forth below.

Recently, the Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007), ruled that to support an obviousness rejection, an explicit analysis of obviousness must be made determining “whether there was an apparent reason to

combine the known elements in the fashion claimed by the patent at issue.” Even in light of the Supreme Court’s opinion in *KSR*, the “teaching, suggestion, or motivation” test, or “TSM” test, is still an informative factor in considering whether or not a claimed invention would have been obvious. This is particularly the case in situations such as present situation wherein (1) the claimed invention is not merely a combination of known elements and (2) the Examiner cites only a single reference rather than a combination of references, as a basis for rejecting the claimed invention as having been obvious. In considering the patentability of claims of the Subject Application, the TSM test and other factors are all tools relevant to determining whether a person of ordinary skill in the art would have found it obvious to modify the cited prior art reference in the manner asserted by the Examiner.

With the foregoing in mind, the Examiner’s rejection does not establish a *prima facie* case of obviousness for at least the following reasons. First, Satran does not teach or suggest all of the elements and limitations recited in the rejected claims. Second, there is no suggestion or motivation provided in Satran or in the art generally to modify the reference as suggested by the Examiner. Third, one of ordinary skill would not have reasonably expected that modifying Satran as asserted by the Examiner would have been successful and provided the improved results discussed in the Subject Application. All of these factors support the proposition that one of ordinary skill in the art would not have found it obvious to modify Satran in the manner necessary to achieve the inventions recited in claims 48-63 of the Subject Application.

Applicant respectfully submits that Satran does not disclose each and every claim limitation recited in the rejected claims. Claim 48 recites the element “an antirotation stop protruding from the side wall and the bottom surface of the insert pocket, wherein the antirotation stop comprises at least two substantially planar surfaces and a concave top surface, wherein a portion of the concave surface is in the shape of a portion of a sphere.” As discussed above, Satran does not disclose, nor does it suggest, an antirotation stop protruding from the side wall. In fact, Satran teaches away from a protruding antirotation stop by disclosing a recess in the insert pocket for receiving non-abutting surfaces of the n-fold symmetry. Thus, the element is

not obvious because Satran does not teach or in any way suggest, and in fact teaches away from, this aspect of claim 48.

The Examiner argues that “it would have been an obvious matter of design choice to make the different portions of the recess of whatever form or shape was desired or expedient.” For the following reasons, however, we respectfully disagree. We also assert that the claimed invention of the Subject Application provides unexpected results, thus further demonstrating that the claimed inventions would not have been obvious.

Satran discloses a cutting tool assembly and cutting insert having a polygonal lower flank surface. A polygon by nature is composed of a finite number of sequential line segments. In Satran, the lower flank surface of the cutting insert contacts the abutment surface of the tool holder in at least two places. The flank contacts the abutment surface in a way that can be described as linear or planar -- in other words, a planar portion of the at least two parts of the flank contact at least two corresponding planar portions of the abutment surfaces. The planes are defined by two-dimensional surfaces of the shank and abutment surface that are designed to be complementary, meaning that the corresponding insert and tool holder surfaces are designed to abut rather precisely when the insert is placed in the tool holder and secured by a screw. Any torque imposed on the insert, when torquing the attachment screw or during cutting operations, is designed to be counteracted by the planar contact between shank and abutment surfaces. One problem with Satran’s assembly is that in order to perform properly, the at least two complementary planar surfaces must match precisely when the cutting insert is secured in the insert pocket of the tool holder by the screw. If the at least two surfaces are not machined to exacting tolerances, torque applied to the cutting insert will rotate or “rock” the insert about the attachment screw back and forth between the two complementary planar surfaces, and this would result in imprecise cuts and premature wear, among other problems.

The present claimed invention is an improvement over the cutting tool assembly and cutting inserts described in Satran. As recited in claim 49, the insert recess and antirotation stop of the cutting tool recited in that claim do not include

surfaces that closely abut one another as complementary planar surfaces, but instead are designed with non-complementary shapes. Because of this non-complementary design, the machining tolerances for the cutting insert recess and the antirotation stop in the invention recited in claim 49 need not be as precise as in the complementary arrangement described in Satran. Nevertheless, the non-complementary arrangement of the invention recited in claim 49 still provides for secure mounting of the insert in the tool holder.

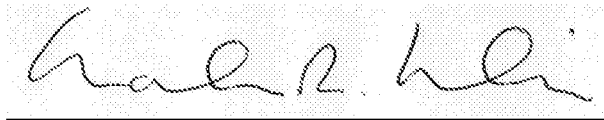
Satran in no way describes or suggests securing a cutting insert in the insert pocket of a tool holder using an antirotation stop and a recess in the insert and wherein the stop and the recess have non-complementary shapes. In fact, Satran clearly teaches away from the use of non-complementary shapes as it solely focuses on an indexing system relying on the mating of planar (flat) surfaces on the polygonal lower flank of a cutting insert with complementary planar (flat) surfaces on the tool holder. Paragraphs 7-15 of the Subject Application, for example, also discuss why one having ordinary skill in the art would not have found it obvious to use non-complementary surfaces to secure a cutting insert in a tool holder. The examples of prior art arrangements cited in the specification rely on complementary planar or complex complementary three-dimensional shapes to counteract torque, which contrasts with the invention recited in claim 49, which takes advantage of non-complementary shapes. Applicants submit that because the cited references do not teach or in any way suggest using an arrangement of non-complementary shapes to secure a cutting insert, there would have existed been no expectation that such an arrangement would have been successful. There certainly would also have been no expectation that using non-complementary shapes would provide improved stability and a reduced tendency for movement between the insert and the tool holder relative to arrangements relying on complementary surfaces to secure the insert in the pocket of the tool holder. Thus, consideration of Satran and the prior art cited in the Subject Application shows that the invention recited in claim 49 would not have been “an obvious matter of design choice,” but instead is a unique and non-obvious design that has provided unexpectedly improved performance relative to the designs described in Satran and in the other prior art of record.

Thus, it is respectfully submitted that the Examiner has failed to provide a sufficient rationale why one of ordinary skill in the art would have modified Satran or any other prior art of record to arrive at the invention recited in claim 49. The Examiner has not established a prima facie case of obviousness. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 48 dependent claims 49-63.

CONCLUSION

Applicants respectfully assert that the claims of the Subject Application, as amended herein, recite subject matter that is patentable over the cited references. Applicants respectfully request issuance of a Notice of Allowance at an early date. If, however, the Examiner is of the opinion that the Subject Application is in condition for disposition other than allowance, Applicants respectfully request that the Examiner contact Applicants' attorney at the telephone number listed below so that those concerns may be addressed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark R. Leslie", is written over a horizontal line.

Date: May 16, 2007

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